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UTILITY
PATENT APPLICATION
TRANSMITTAL

(Only new nonvisional applications under 37 CFR 1 53(b))

Attorney Docket No.	17207-00006
First Named Inventor or Application Identifier	Balwinder S. Samra and Oumar Nabe
Title	METHODS AND SYSTEMS FOR ANALYZING HISTORICAL TRENDS IN MARKETING CAMPAIGNS
Express Mail Label No	EL319728006US

APPLICATION ELEMENTS
See MPEP chapter 600 concerning utility patent application contents

ADDRESS TO

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Washington, DC 20231

JC690 U.S. PTO
09/474631
12/29/99

[X] 1. Fee Transmittal Form (e.g., PTO/SB/17)
(Submit an original, and a duplicate for fee processing)

[X] 2. Specification   [Total Pages] [11]
(Preferred arrangement set forth below)
- Descriptive title of the Invention
- Cross References to Related Applications
- Statement Regarding Fed sponsored R & D
- Reference to Microfiche Appendix
- Background of the Invention
- Brief Summary of the Invention
- Brief Description of the Drawings (if filed)
- Detailed Description
- Claim(s)
- Abstract of the Disclosure

[X] 3. Drawing(s) (35 USC 113)   [Total Sheets] [8]

4. Oath or Declaration   [Total Pages]

a. [ ] Newly executed (original or copy)

b. [ ] Copy from a prior application (37 CFR 1 63(d))
(for continuation/divisional with Box 17 completed)
[Note Box 5 below]

[ ] DELETION OF INVENTOR(S)
Signed statement attached deleting inventor(s) named
in the prior application, see 37 CFR 1 63(d)(2) and
1 33(b).

5. [ ] Incorporation by Reference (useable if Box 4b is checked)
The entire disclosure of the prior application, from which a copy of the
oath or declaration is supplied under Box 4b, is considered as being part
of the disclosure of the accompanying application and is hereby
incorporated by reference therein

6 [ ] Microfiche Computer Program (Appendix)

7 Nucleotide and/or Amino Acid Sequence Submission
(If applicable, all necessary)
a [ ] Computer Readable Copy
b [ ] Paper Copy (identical to computer copy)
c [ ] Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

8 [ ] Assignment Papers (cover sheet & document(s))

9 [ ] 37 CFR 3 73(b) Statement   [ ] Power of Attorney
(when there is an assignee)

10 [ ] English Translation Document (if applicable)

11 [ ] Information Disclosure   [ ] Copies of IDS
Statement (IDS)/PTO-1449   Citations

12 [ ] Preliminary Amendment

13 [X] Return Receipt Postcard (MPEP 503)
(Should be specifically itemized)

14 [ ] Small Entity   Statement filed in prior application,
Statement(s)   Status still proper and desired
(PTO/SB/09-12)

15 [ ] Certified Copy of Priority Document(s)
(If foreign priority is claimed)

16 [X] Other EXPRESS MAIL CERTIFICATE & DECLARATION AND POWER
OF ATTORNEY (FOR IDENTIFICATION OF INVENTOR ONLY)

*NOTE FOR ITEMS 1 & 14 IN ORDER TO BE ENTITLED TO PAY SMALL ENTITY FEES, A SMALL
ENTITY STATEMENT IS REQUIRED (37 C F R §1 27), EXCEPT IF ONE FILED IN A PRIOR
APPLICATION IS RELIED UPON (37 C F R § 1 28)

17. If a CONTINUING APPLICATION, check appropriate box and supply the requisite information
[ ] Continuation   [ ] Divisional   [ ] Continuation-in-part (CIP)   of prior application No
Prior applicaton information   Examiner   Group/Art Unit

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METHODS AND SYSTEMS FOR ANALYZING
HISTORICAL TRENDS IN MARKETING
CAMPAIGNS

BACKGROUND OF THE INVENTION

This invention relates generally to marketing and, more particularly, to methods and systems for identifying and marketing to segments of potential customers.

Typical marketing strategies involve selecting a particular group based on demographics or other characteristics, and directing the marketing effort to that group. Known methods typically do not provide for proactive and effective consumer relationship management or segmentation of the consumer group to increase efficiency and returns on the marketing campaign. For example, when a mass mailing campaign is used, the information used to set up the campaign is not segmented demographically to improve the efficiency of the mailing. The reasons for these inefficiencies include the fact that measurement and feedback is a slow manual process that is limited in the depth of analysis. Another reason is that data collected from different consumer contact points are not integrated and thus does not allow a marketing organization a full consumer view.

Results of this inefficient marketing process include loss of market share, increased attrition rate among profitable customers, and slow growth and reduction in profits.

BRIEF SUMMARY OF THE INVENTION

Models are used in methods and systems for evaluating marketing campaign data. Models are mathematical algorithms that map customer and/or account attributes to scores that indicate, for example, a customer's propensity to attrite, default on payments, and expected profitability. Models are used to target segments for marketing. On Line Analytical Processing (OLAP) structures based on campaign drivers, which are attributes used in the models, and can be built for several campaigns to yield time based history structures. The method includes the steps of evaluating models and discovering user defined trends in the time based history structures.

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BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a block diagram of an exemplary embodiment of a web-based global modeling architecture;

Figure 2 is a block diagram of an exemplary embodiment of a targeting engine;

Figure 3 is an exemplary graphical user interface for pre-selecting mailing criteria;

Figure 4 is an exemplary user interface for the input of marketing criteria;

Figure 5 is an exemplary user interface for selection of structures;

Figure 6 is an exemplary user interface for selection of campaigns;

Figure 7 is an exemplary user interface for creation of a selection table; and

Figure 8 is an exemplary user interface for a gains chart.

DETAILED DESCRIPTION OF THE INVENTION

Exemplary embodiments of processes and systems for integrating targeting information to facilitate identifying potential sale candidates for marketing campaigns are described below in detail. In one embodiment, the system is internet based. The exemplary processes and systems combine advanced analytics, On Line Analytical Processing (OLAP) and relational data base systems into an infrastructure. This infrastructure gives users access to information and automated information discovery in order to streamline the planning and execution of marketing programs, and enable advanced customer analysis and segmentation of capabilities.

The processes and systems are not limited to the specific embodiments described herein. In addition, components of each process and each system can be practiced independent and separate from other components and processes described herein. Each component and process can be used in combination with other components and processes.

Figure 1 is a block diagram of an exemplary embodiment of a web-based global modeling architecture 10. Data from various international markets 12 is compiled in a consumer database 14. Consumer database 14 contains user defined information such as age, gender, marital status, income, transaction history, and transaction measures. Customer database 14 is accessible by a server 16. Server 16 stores the consumer database 14 in a relational database such that the consumer data is accessible to a targeting engine (not shown in Figure 1) which takes data input and based upon modeling generates user interfaces 18. Architecture 10 may also be client/server based.

Figure 2 illustrates a marketing system 20. Included in marketing system 20 are a targeting engine 22 and a plurality of data inputs and outputs. Data inputs include a customer database 24, selection criteria 26, previous campaign results 28 and marketing data 30. Targeting engine 22 generates targeting mailing lists 32, campaign and data structures 34 and gains charts 36. Historical campaign and data structures 34 are reusable by targeting engine 22. Targeting engine 22 also generates outputs to a user interface 38, typically in a graphic format. Targeting engine 22 streamlines the planning and execution of marketing programs and enables advanced customer analysis and segmentation capabilities. Targeting engine 22 further delivers information in a proactive and timely manner to enable a user to gain a competitive edge. Targeting engine 22 accomplishes these goals through the use of models.

MODELS

Models are predicted customer profiles based upon historic data. Any number of models can be combined as an OLAP cube which takes on the form of a multi dimensional structure to allow immediate views of dimensions including for example, risk, attrition, and profitability.

Models are embedded within targeting engine 22 as scores associated with each customer, the scores can be combined to arrive at relevant customer metrics. In one embodiment, models used are grouped under two general categories, namely marketing and risk. Examples of marketing models include: a net present value / profitability model, a prospect pool model, a net conversion model, an early termination (attrition) model, a response model, a revolver model, a balance transfer model, and a reactivation model. A propensity model is used to supply predicted answers to questions such as, how likely is this customer to: close out an account early, default, or avail themselves to another product (cross-sell). As another

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example, profitability models guide a user to optimized marketing campaign selections based on criteria selected from the consumer database 24. A payment behavior prediction model is included that estimates risk. Other examples of risk models are a delinquency and bad debt model, a fraud detection model, a bankruptcy model, and a hit and run model. In addition, for business development, a client prospecting model is used. Use of models to leverage consumer information ensures right value propositions are offered to the right consumer at the right time by tailoring messages to unique priorities of each customer.

<p style="text-align:center">TARGETING ENGINE</p>

Targeting engine 22 combines the embedded models described above to apply a score to each customer's account and create a marketing program to best use such marketing resources as mailing, telemarketing, and internet online by allocating resources based on consumer's real value. Targeting engine 22 maintains a multi-dimensional customer database based in part on customer demographics. Examples of such customer related demographics are: age, gender, income, profession, marital status, or how long at a specific address. When applied in certain countries, that fact that a person is a foreign worker could be relevant. The examples listed above are illustrative only and not intended to be exhaustive. Once a person has been a customer, other historical demographics can be added to the database, by the sales force, for use in future targeting. For example, what loan products a customer has previously purchased is important when it comes to marketing that person a product in the future in determining a likelihood of a customer response. To illustrate, if a person has purchased an automobile loan within the last six months, it probably is unreasonable to expend marketing effort to him or her in an automobile financing campaign.

However a cash loan or home equity loan may still be of interest to the automobile loan purchaser. In deciding whether to market to him or her, other criteria that has been entered into the targeting engine 22 database in the form of a transaction database can be examined. The transaction database contains database elements for tracking performance of previously purchased products, in this case the automobile loan. Information tracked contains, for example, how often payments have been made, how much was paid, in total and at each payment, any arrears, and the percentage of the loan paid. Again the list is illustrative only. Using information of this type, targeting engine 22 can generate a profitability analysis by combining

<p style="text-align:center">-4-</p>

models to determine a probability score for response, attrition and risk. Customers are rank ordered by probability of cross-sell response, attrition, risk, and net present value.. For example, if a consumer pays a loan off within a short time, that loan product was not very profitable. The same can be said of a product that is constantly in arrears. The effort expended in collection efforts tends to reduce profitability.

When a marketer embarks on a campaign, they will input into targeting engine the desired size of the campaign. Using 60,000 as an example, the marketer inputs the target consumer selection criteria 26, some subset of the demographics listed above, into targeting engine 22.

Targeting engine uses the stored databases and generates a potential customer list based on scores based on demographics and the propensity to buy another loan product and expected profitability. Customers can be targeted by the particular sales office, dealers, product type, and demographic profile. Targeting engine enables a user to manipulate and derive scores from the information stored within the consumer and structure databases. These scores are used to rank order candidate accounts for marketing campaigns based upon model scores embedded within the consumer and structure databases and are used in a campaign selection. Scores are generated with a weight accorded the factors, those factors being the demographics and the models used. Using the scores and profitability targeting engine generates a list of potential profitable accounts, per customer and / or per product, in a rank ordering from a maximum profit to a zero profit versus cost.

As candidate accounts are ranked by a selected model score, targeting engine 22 (shown in Figure 2) performs calculations at which marginal returns become zero, and the user is alerted to an optimal mailing depth which can override initial manually selected campaign size to form a marketing campaign customer list. The selected marketing campaign results in a database table which has the customer identification number, relevant model scores, flags that indicate whether the customer is a targeted or a random selection, and an indicator for the product offered. As shown in Figure 7, a user can use a user interface 80 to choose a particular database table. As an example, targeting engine 22 may determine that a mailing of 40,000 units, as opposed to the requested 60,000 units, is the maximum profitable for the example campaign. Conversely, targeting engine 22 may also determine that, for the requested campaign, 100,000 units have profit potential and will flag that information

to the marketer. To arrive at expected profitability numbers, targeting engine 22, has the capability to deduct costs, such as mailing cost, from a proposed campaign.

GRAPHICAL USER INTERFACE

Users input the target consumer selection criteria 26 into targeting engine 22 through a simple graphical user interface 38. An exemplary example of a graphical user interface is shown in Figure 3. In this exemplary example, one of the options available to a user is to input pre-selection criteria for a mailing campaign 40. Once the user selects the mailing pre-selection criteria 40 option, another user interface 50, one possible example is Figure 4, allows the user to input the marketing criteria. Example marketing criteria shown are age 52, credit line 54, a profession code 56, and a plurality of risk factors 58.

Once a user has input the marketing campaign pre-selection criteria into targeting engine, that criteria is retained by a targeting engine database. Details of all available criteria are retained as entries in a database table and duplication of previous efforts is avoided.

Marketing campaigns can be stored within targeting engine 22. An exemplary example showing a graphical interface 60 used to choose previous marketing campaigns is shown in Figure 5. In this example, a user can choose between Campaign1 62 and Campaign2 64. Figure 6 is a user interface 70 showing structures associated with Campaign2 64. Structure1 72 indicates that analysis of the campaign based on age, gender, credit line and the targeting model is available. Users can build new structures on an ad-hoc basis by choosing the Create New Structure 74 on user interface 70. By stacking structures of different campaigns in chronological order trends within segments can be discerned. As a result of the storage of marketing campaign structures within targeting engine database, those structures having time as one of the database elements allow a user to define trends whereby a marketing campaign history structure which is automatically analyzed by targeting engine 22.

TREND ANALYSIS

A trend analysis is a way to look at multiple marketing campaigns over time and is also a way to evaluate the models used and define trends. As an example of trend analysis, the user can determine where a response rate has been changing or

where profitability has been changing or look at the number of accounts being closed. A user can also analyze particular population segments over time.

Trend analysis can be used to track how a particular segment, males from age 25 – 35 with an auto loan for example, may change in a propensity to avail themselves to other loan products over time.

CAMPAIGN ANALYSIS

A user can create marketing test cells in the targeted accounts. Test cells are created using a range of selection criteria and random assignments. Accounts satisfying selection criteria are counted. A marketing cell code for each account is assigned in the campaign table. The user can then output the contents of the campaign table to a file that can be exported to print a campaign mailing.

A user can profile selected accounts and assign a score for any campaign against a list of user defined dimensions. Assigning a score allows results to be rank ordered. Profiling shows how targeted accounts differ from non-selected accounts and is used to ensure the campaign is reaching the target base of the campaign. Profiling dimensions are selected during the initial customization process. Profiling can be done directly on a portfolio without any reference to marketing campaigns.

Targeting engine 22 also accepts marketing campaign results based upon each customer. Additional information can be appended onto the marketing campaign result files that become part of the consumer database. Exemplary examples of information that is added to the marketing campaign result files are: loan size, loan terms, and risk score. Campaign analysis is done by comparing the original marketing campaign customer list against marketing campaign results. Targeting engine 22 then profiles this comparison information to construct gains charts.

Maintaining feedback into targeting engine 22 improves subsequent modeling cycles. In the 60,000 example campaign explained previously, assume the size of the actual campaign after targeting engine applied a model was 40,000 mailings. Information regarding who responded and how much was lent, for example, is input into targeting engine. Analysis facilitates a determination of how good the model performed when it told the marketer 40,000 mailings was the optimal campaign size. Analysis is accomplished in one embodiment by the use of gains charts. As an

example, the gains charts for the 40,000 mailings campaign may indicate that a mailing to 10% of the group may actually obtain 20% of all potential responders.

An exemplary gains chart is displayed on the user interface 90 shown in Figure 8. As shown in Figure 8, when models are used to generate prospective customers for a marketing campaign, a larger number of responses per campaign size is generated, thereby increasing the efficiency of the marketing campaign and identifying risks such as delinquency and fraud. A gains chart approach allows a user to track performance of models used over several marketing campaigns and therefore allows a user to show where the model works best and where the performance of the model need to be addressed.

Scores for customer accounts are generated as a part of a campaign analysis. Models are used to assign a score to an account as a result of a completed campaign.

While the invention has been described in terms of various specific embodiments, those skilled in the art will recognize that the invention can be practiced with modification within the spirit and scope of the claims. For example, although the above embodiments have been described in terms of a mailing campaign, the methods and systems described above are applicable to internet E-mail based campaigns and telemarketing campaigns.

WHAT IS CLAIMED IS:

1. A method of evaluating marketing campaign data, the data being in the form of database scores, stored procedures, and OLAP multidimensional structures, said method comprising the steps of:

evaluating models using structures that can segment gains charts to discover where a model is under performing; and

evaluating models performance over time and discovering user defined trends.

2. A method according to Claim 1 wherein said step of discovering user defined trends further comprises the step of determining where profitability has been changing over time.

3. A method according to Claim 1 wherein said step of discovering user defined trends further comprises the step of determining where a response rate has been changing over time.

4. A method according to Claim 1 wherein said step of discovering user defined trends further comprises the step of determining where a number of accounts are being closed.

5. A method according to Claim 1 wherein said step of evaluating models is accomplished by creating history structures based on user defined attributes.

6. A method according to Claim 1 wherein said step of discovering user defined trends further comprises the step of analyzing a particular population segment.

7. A method according to Claim 1 wherein said step of evaluating models performance over time and discovering user defined trends further comprises the step of maintaining feedback into a targeting engine to improve subsequent modeling cycles.

8. A method according to Claim 1 wherein said step of discovering user defined trends further comprises the step of using gains charts to illustrate model performance in segments.

9. A system configured to evaluate marketing campaign data, said system comprising:

> a customer database further comprising historical campaign results;

> a graphical user interface for presentation of trend analysis data; and

5
> and optimal targeting using models.

10. A system according to Claim 9 further configured to evaluate models that are time based multidimensional On Line Analytical Processing (OLAP) history structures.

11. A system according to Claim 9 further configured to discover user
10   defined trends.

12. A system according to Claim 9 further configured to determine where profitability has been changing over time.

13. A system according to Claim 9 further configured to determine where a response rate has been changing over time.

15   14. A system according to Claim 9 further configured to determine where a number of accounts are being closed.

15. A system according to Claim 9 further configured to determine propensity of a customer to avail themselves to other products over time.

16. A system according to Claim 9 further configured to check model
20   performance of the model based on user defined criteria.

17. A system according to Claim 9 further configured to analyze a particular population segment.

18. A system according to Claim 9 further configured to maintain feedback into a targeting engine to improve subsequent modeling cycles.

25   19. A system according to Claim 9 further configured to use gains charts to illustrate customer trends.

METHODS AND SYSTEMS FOR ANALYZING
HISTORICAL TRENDS IN MARKETING
CAMPAIGNS

ABSTRACT OF THE DISCLOSURE

Method and systems using models for evaluating marketing campaign data in the form of database scores, stored procedures, and OLAP multidimensional structures. Models are used to target segments for marketing. The models are mathematical algorithms that map customer and/or account attributes such as, a customer's propensity to attrite, default on payments, and expected profitability. The method includes the steps of evaluating models using OLAP structures based on campaign drivers, that can segment gains charts to discover where a model is under performing and evaluating models performance over time to discover user defined trends.
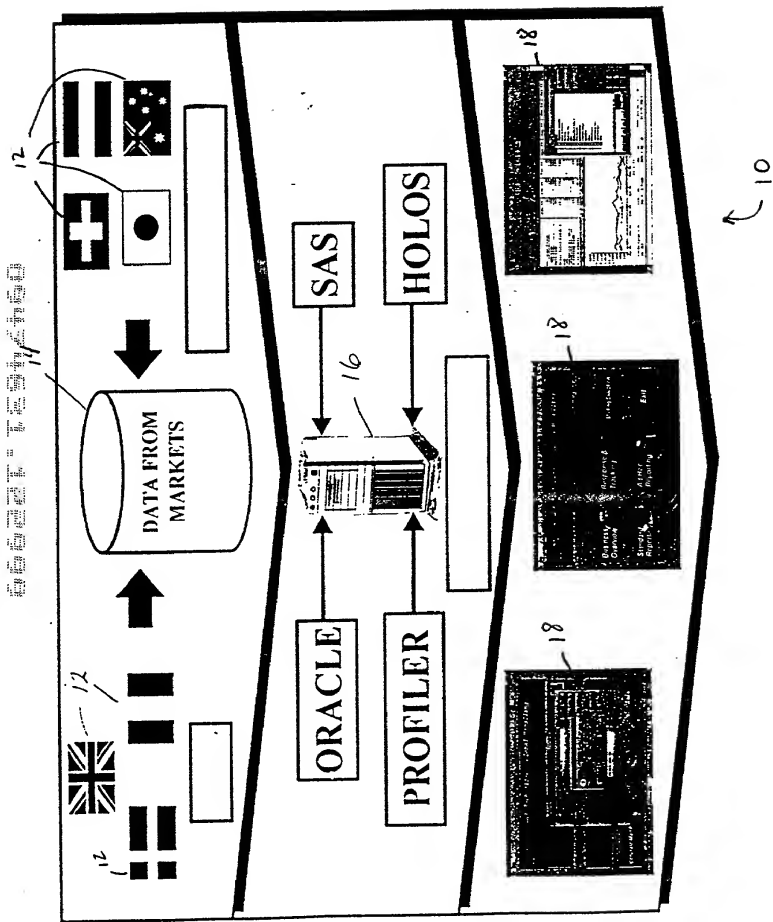
5

FIG. 1

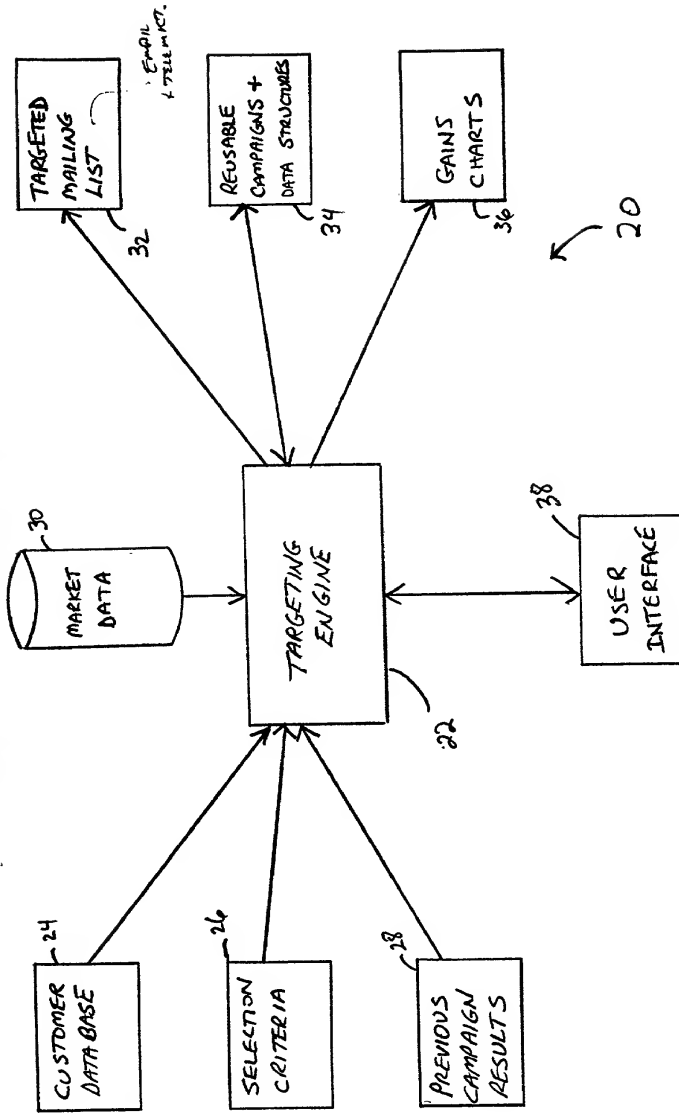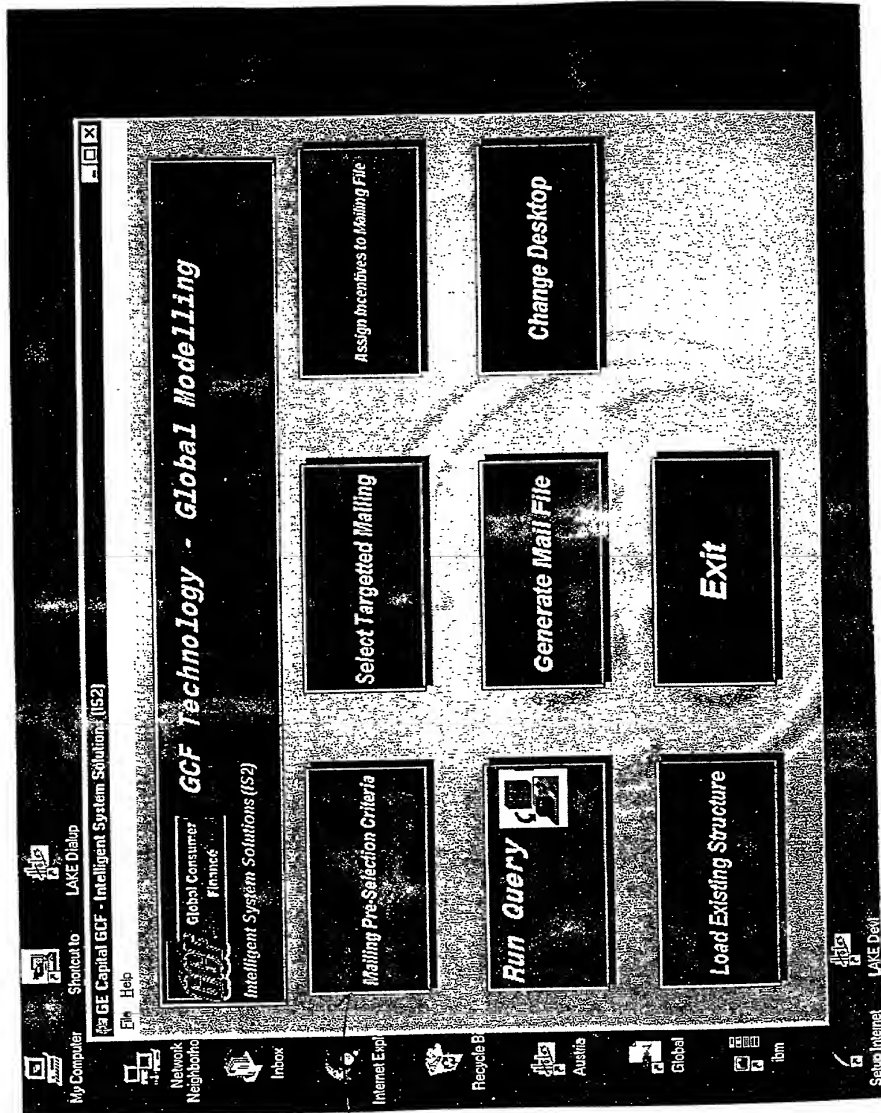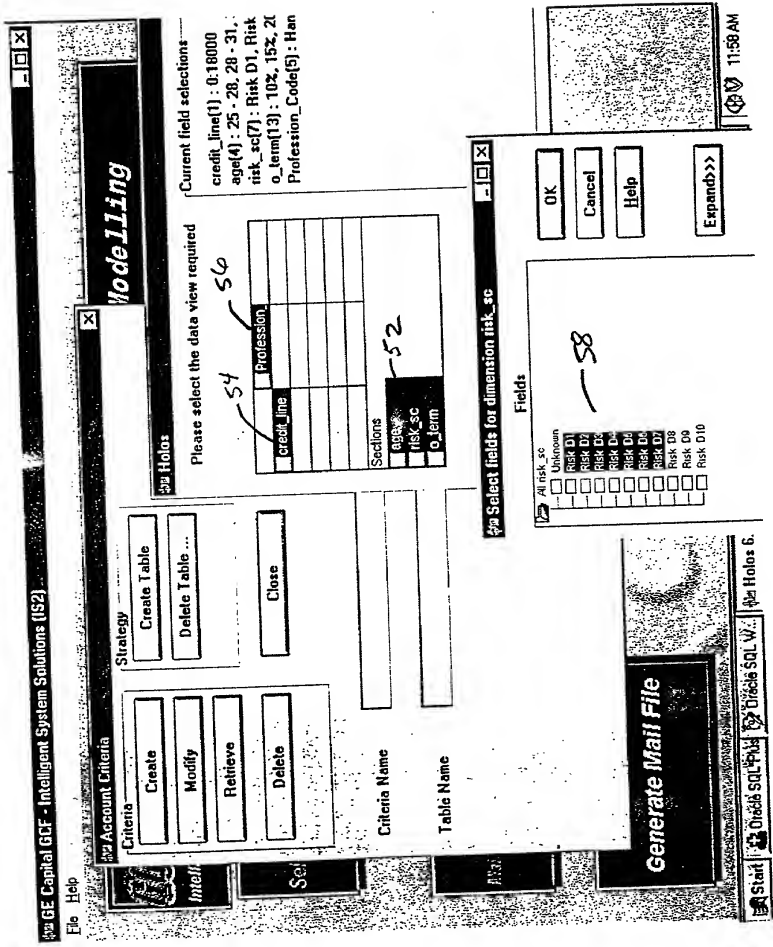FIG. 2

FIG 3

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FIG. 4

GE Capital GCF - Intelligent System Solutions (IS2)

File   Help

Modelling

Holos

Please select the data view required

Current field selections:

credit_line(1) : 0:18000
age(4) : 25 - 28, 28 - 31, .
risk_sc(7) : Risk D1, Risk
o_term(13) : 10%, 15%, 20
Profession_Code(5) : Han

Account Criteria

Criteria
    Create
    Modify
    Retrieve
    Delete

Strategy
    Create Table
    Delete Table ...
    Close

Criteria Name

Table Name

credit_line   Profession

Sections
    age
    risk_sc
    o_term

54   54   56

52

Select fields for dimension risk_sc

All risk_sc
    Unknown
    Risk D1   Risk D8
    Risk D2   Risk D9
    Risk D3   Risk D10
    Risk D4
    Risk D5
    Risk D6
    Risk D7

Fields

58

OK

Cancel

Help

Expand>>>

Generate Mail File

Start   Oracle SQL Plus   Oracle SQL W...   Oracle SQL W...   Holos 6.

11:58 AM

50

FIG. 5

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FIG. 6

FIG 7

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FIG. 8

GAIN CHART

File Edit Help

New section field

age   : All Ages

Gender   : All Gender
credit_line : All Credit
model_maint : mod_max_score

Percentage Cumulative Response

Percentile of Population

— Model Selection   — Random Selection

Total # of Account   :
Total # of Responders   :
# of Account   :   29602   % of Account   :   100%
# of Responders   :   5055   % of Responders   :   100%
                                   29602   Max Gain   :   27.9%
                                    5055   Min Gain   :   0%

Fields

All Ages
12-24
25-28
28-31
31-34
34-37
37-40
40-44
44-49
49-55
55+

90

DECLARATION AND POWER OF ATTORNEY	Attorney's Docket No.
	17207-00006

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: **METHODS AND SYSTEMS FOR ANALYZING HISTORICAL TRENDS IN MARKETING CAMPAIGNS**, the specification of which:

(check one) [✓] is attached hereto

       [ ] was filed on _____ as Application Serial No. _____,

          and was amended on _____.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations §1.56(a).

I hereby claim priority benefits under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112. I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

Application Serial No.	Filing Date	Status (patented, pending, abandoned)

I hereby claim the benefit under Title 35, United States Code §119(e) of any United States provisional application(s) listed below:

Application Serial No.	Filing Date	
		_____ Additional provisional application numbers are listed on a supplemental priority sheet attached hereto.

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (*list name and registration number*)

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	Attorney's Docket No.
DECLARATION AND POWER OF ATTORNEY	**17207-00006**

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application and any patent issued thereon.

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CERTIFICATE OF MAILING BY EXPRESS MAIL TO
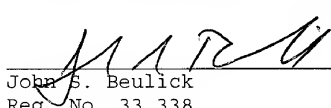THE COMMISSIONER OF PATENTS AND TRADEMARKS

Express Mail mailing label number: __**EL319728006US**__

Date of Mailing: __**December 29, 1999**__

    I certify that the attached complete utility patent Application
of **BALWINDER S. SAMRA and OUMAR NABE** for **METHODS AND SYSTEMS FOR
ANALYZING HISTORICAL TRENDS IN MARKETING CAMPAIGNS**, including:

- Patent Application Transmittal (1 page)

- Fee Transmittal (in duplicate) (1 page)

- Eight (8) pages of specification; two (2) pages of claims;
  one (1) page of abstract

- Eight (8) sheets of drawings

- Declaration and Power of Attorney (2 pages)
  (For purposes of identification of inventor only)

- Certificate of Mailing Via Express Mail (1 page)

- Return post card

is being deposited with the United States Postal Service "Express Mail
Post Office to Addressee" service under 37 C.F.R. §1.10 on the date
indicated above in an envelope addressed to Box Patent Application,
Assistant Commissioner for Patents, Washington, D.C. 20231.

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